



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/689,039

10/21/2003

Shinichi Ooizumi

Q77809

4510

65565 7590 04/04/2007  
SUGHRUE-265550  
2100 PENNSYLVANIA AVE. NW  
WASHINGTON, DC 20037-3213

EXAMINER

DANIELS, MATTHEW J

ART UNIT

PAPER NUMBER

1732

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
--	-----------	---------------

3 MONTHS

04/04/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/689,039	OOIZUMI ET AL.	
	Examiner	Art Unit	
	Matthew J. Daniels	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. PCT/JP00/05779 was published as WO 01/16219 on 8 March 2001, and subsequently as USPN 6559195 to Yamamoto. USPN 6559195 has been used as an English language equivalent of WO 01/16219, and portions relied upon are cited in the '195 patent. The reference WO 01/16219 is available under 35 USC 102(b). A translation is included with this action.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 3-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (WO 01/16219 with USPN 6559195 as the English language equivalent) in view of Shirato (USPN 6090479). **As to Claim 1**, Yamamoto teaches a process of producing porous films comprising the steps of melt kneading a composition comprising a polyolefin resin (5:15-22), a thermoplastic elastomer (3:34-40) and a solvent (4:63); extruding and cooling the melt kneaded material into a sheet molding (5:22-38); rolling the sheet molding (5:31); and stretching and desolvating the rolled sheet molding (5:31-37, 5:39-56). Applicant conceded these teachings in the 2 May 2006 reply. Additionally, Yamamoto teaches heat pressing (9:28-29) by rolling (5:30-31) and a compression ratio of 6 or more ( $3\text{ mm}/0.5\text{ mm} = 6$ , see 5:22-28, Yamamoto teaches ratios of 0.5 to 40).

Yamamoto appears to be silent to:

- a) the cold pressurizing after the rolling of the sheet molding
- b) a the limitation that rolling is carried out under a condition such that the sheet molding after rolling has an elastic recovery rate as calculated by the following equation (1) of 20% or less:  
Elastic recovery rate % =  $100 * (t - t_0)/t_0$ , Wherein  $t_0$  represents a minimum clearance of a sheet rolling section in the rolling, and  $t$  represents a sheet thickness in the elastic recovery state after pressure release.
- c) a rolling coefficient which is 5 or more when the rolling coefficient is calculated by multiplying the rolling ratio times the rolling time.

However, these aspects would have been inherent or prima facie obvious for the following reasons:

- a) Shirato teaches (Fig. 1) a step of heating and a step of cooling between belts (C in Fig. 1), which is interpreted to be a cold pressurizing after the rolling.
- b) Firstly, note that the reference teaches all of the claimed ingredients, process steps, and process conditions, and thus the claimed effects and physical properties would inherently be achieved by carrying out the disclosed process. If it is Applicant's position that this would not be the case: (1) evidence would need to be presented to support that position; and (2) it would be the Examiner's position that the application contains inadequate disclosure in that there is no teaching as to how to obtain the claimed properties and effects by carrying out only these steps.

Secondly, Yamamoto teaches measurement of the shrinkage ratio,  $(R) = 100 * (P_0 - P_1)/P_0$  wherein  $P_0$  is a number of picture elements before shrinkage and  $P_1$  is the number of picture elements after shrinkage (See 8:59-9:8). In the Examiner's interpretation,  $P_0$  and  $P_1$

Art Unit: 1732

pertain to numbers of units of area measured before and after shrinkage. Yamamoto therefore teaches it is known to measure area before and after shrinkage and to achieve shrinkage ratios or rates of as little as 9 to 10% (Table 1, column 12), and that this rate or ratio pertains to elastic recovery after pressure release.

Thirdly, Yamamoto clearly desires a low level of shrinkage and discloses minimizing heat shrinkage by thermal treatment (7:20-22) or crosslinking (5:63). The Examiner asserts that because Yamamoto teaches methods for minimizing shrinkage and that lower levels are generally more desirable (Table 1, column 12 and 7:27-29), that the ratio or rate of shrinkage represents a result-effective variable that the ordinary artisan would have found it *prima facie* obvious to optimize the to the most desirable level, namely to a value of zero shrinkage, using the techniques suggested by Yamamoto. Doing so would have obviously or implicitly achieved the same recovery rate as that sought in the instant invention.

c) Shirato teaches that times longer than 1 minute are required for pressing (28:60-63) are required to achieve a thickness of 10 mm (28:63, also see Yamamoto 5:24-28).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Shirato into that of Yamamoto because Yamamoto suggests an extruder (5:15-22), heat pressing (5:24-27) of a film containing polyolefins (3:47-63) and pentane (5:46), and rolling methods which stretch vertically and horizontally (5:30-38), and Shirato provides an extruder (6:36-44), heat pressing (8:23-35) of a film containing polyolefins (2:42-3:20, 6:18-22) and pentane (3:31), and rolling methods which would stretch vertically and horizontally (Fig. 1). **As to Claims 3 and 4**, Shirato teaches rolling continuously carried out by a double belt pressure roller type pressing machine (Fig. 1). Shirato's Fig. 1 shows one belt

Art Unit: 1732

pressing machine as recited in Claim 4. **As to Claim 5**, Yamamoto teaches heated compression within the claimed temperature range (See melting points of 132 C and 144 C in 9:15-19 and heat pressing at 115 C in 9:29-30). Shirato teaches cold pressurizing (Fig. 1, C) of a mixture including pentane (4:10-15), and that the cooling temperature is set below the boiling point of the solvent, such as pentane (8:40-45) which is inherently 40 C or lower. Also see the Examples of Shirato for other experimental conditions. **As to Claim 6**, Yamamoto teaches a composition comprising a crosslinkable, double bond-containing, thermoplastic elastomer (2:67, 3:34-40, 3:60-63, 6:1-4). Shirato also provides teaching of cross linking. **As to Claim 7**, this intended use limitation does not materially affect the claimed process, and therefore should not be given patentable weight. However, Yamamoto clearly teaches battery separators (column 1).

### *Response to Arguments*

3. Applicant's arguments filed 18 January 2007 have been fully considered but they are not persuasive or are moot in view of the new grounds of rejection above. The arguments appear to be on the following grounds:

- a) The shrinkage rate is not inherent.
- b) Pressing time is not a result-effective variable.
- c) The comparison between Example 3 and Comparative Example 2 shows unexpected results.
- d) Yamamoto teaches cooling before the heat-pressing, and does not teach the claimed step, cooling after rolling, and does not teach the cold pressurizing after heat rolling.

4. These arguments are not persuasive for the following reasons:

a) The Examiner maintains the positions set forth previously with regard to the shrinkage rate.

Those positions are repeated in the rejection of Claim 1. Additionally, Yamamoto suggests to minimize the shrinkage “rate” and the Examiner asserts that shrinkage therefore represents a result effective variable which would be optimized, resulting in a minimum shrinkage.

b) The new reference to Shirato is presented to better address the new limitation to Claim 1 and the limitations of Claim 2 incorporated into Claim 1. Yamamoto teaches rolling ratios of at least 6 (see the rejection above), and as high as 40 (20/0.5). The only process variable with regard to the rolling that is not taught explicitly is the particular time that the pressure is acting. The Examiner asserts that the pressing time is a result effective variable that one would optimize for the reasons set forth previously, but additionally Shirato teaches particular pressing times that read on the claimed invention in combination with Yamamoto.

c) The comparison between Example 3 and Comparative Example 2 is noted. If it is Applicant’s position that the rolling ratio provides the needle penetration strength which is asserted to be unexpected regardless of the rolling time (which is required to calculate the rolling coefficient), then it would be the Examiner’s position that by providing the same rolling coefficient, Yamamoto would also render obvious the particular rolling coefficient.

d) The cold pressurizing in Claim 1 is new, however, Shirato teaches a step of cold pressurizing in the claimed order. The rejection above provides the claimed element.

Art Unit: 1732

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJD 4/2/07

*MJD*

*cr*  
CHRISTINA JOHNSON  
SUPERVISORY PATENT EXAMINER

*4/4/07*